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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,776	10/20/2003	Kyung Su Chae	0465-0990P	9604
2292 7590 10/17/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
MILLER, MICHAEL G				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
10/17/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/687,776

Applicant(s)

CHAE ET AL.

Examiner

MICHAEL G. MILLER

Art Unit

1792

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11, 12 and 15-22 is/are pending in the application.
- 4a) Of the above claim(s) 15-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

- 1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 SEP 2008 has been entered.

Response to Amendment

- 2) Examiner notes the following amendments to the application:
- a) Claim 1 has been amended to include required advantages of the method.
 - b) Claim 1 has been amended to include process time requirements for the method.
 - c) Claim 1 has been amended to include substrate continuity requirements.
- 3) The status of the claims in the case is as follows:
- a) Claims 1-9 and 11-12 are under examination.
 - b) Claims 10 and 13-14 are canceled.
 - c) Claims 15-22 are withdrawn.

Response to Arguments

- 4) Applicant's arguments filed 30 SEP 2008 have been fully considered but they are not persuasive.
- 5) Applicant argues that the claim as amended provides that a time to receive the substrate in the printing part is different from the time to transfer the substrate into the drying part, and therefore provides the advantages of minimizing process time and lowering the probability of adsorption of particles to the substrate. Nowhere in the specification or in the associated figures is printing and drying time discussed in the claims, which raises the issue of new matter being brought into the specification. Further, even if this was not new matter, the claim presents the advantages as being attributable to the arrangement of the printing and drying parts. The prior art teaches the same arrangement of printing and drying parts and therefore must receive any advantages accrued by said arrangement.
- 6) Applicant argues that Fairbairn does not explicitly teach the drying part directly and vertically above the printing part. As discussed in the prior Office action, Satoi teaches the printing part and the drying part. If those parts were to be stacked directly and vertically one over the other, there are a finite number of arrangements (two) in which this can be done. It is within the skill of a person having ordinary skill in the art to choose from a list of finite options when all options have a reasonable expectation of success.
- 7) Applicant argues that Fairbairn only teaches moving multiple wafers at the same time. Examiner points to Column 4 Lines 14-19 wherein Fairbairn discusses multiple

independent robots for moving substrates between processing chambers with different cycle times, which addresses the issue of moving single substrates.

- 8) Applicant argues that the substrates in the process chambers of Fairbairn are different from each other. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Sato teaches the sequential processing of individual substrates at Column 12 Line 36 – Column 13 Line 15.

Claim Rejections - 35 USC § 112

- 9) The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- 10) Claims 1-9 and 11-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In response to the amended Claim 1, Applicant cites that Figures 4-6 and the related descriptions in the specification enable the advantages of saving time, lowering particle adsorption to the substrate, and preventing defects in the drying process. The pictures do not

show these advantages, and the specification is silent as to them. The dependent claims do not address this deficiency.

11)The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12)Claims 1-9 and 11-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13)The terms "saving" and "lowering" in Claim 1 are relative terms which render the claim indefinite. The specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The dependent claims do not fix this deficiency.

Claim Rejections - 35 USC § 103

14)The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15)The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- (1) Determining the scope and contents of the prior art.

- (2) Ascertaining the differences between the prior art and the claims at issue.
- (3) Resolving the level of ordinary skill in the pertinent art.
- (4) Considering objective evidence present in the application indicating obviousness or nonobviousness.

- 16) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
- 17) As these claims are drawn to a device, portions of the claim which do not define physical structure will be given limited patentable weight to the extent that they provide requirements that the device must be capable of.
- 18) Claims 1-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Patent 6,331,384, hereinafter '384) and Fairbairn et al (US Patent 6,176,667, hereinafter '667).
- 19) With regard to Claim 1, '384 teaches a device usable for forming an alignment layer of a display apparatus, the device comprising:
- a) A printing part (Column 12 Lines 36-64, specifically the stage 52) to print an alignment layer on a substrate;
 - b) A drying part (Column 13 Lines 1-15, specifically referencing heating apparatus 208) to dry the alignment layer printed on the substrate; and

- c) A transferring part (Column 14 Lines 36-49 discussing conveyors and robots) to transfer the substrate including a transfer robot to transfer the substrate from the printing part to the drying part by elevating the substrate ('384 Column 14 Line 60 – Column 15 Line 27 details a robot capable of motion in the vertical and radial directions of cylindrical coordinates; choosing a robot for this transfer would be one of a finite number of choices that a person skilled in the art would be able to choose between with a reasonable expectation of success).
- d) '384 does not teach that the drying part is disposed directly and vertically above the printing part. However, '384 teaches that its linear embodiment is only exemplary and that the units can be individual with substrates transferred individually (Column 18 Lines 38-45).
- e) '667 teaches that stacking process chambers above each other can reduce the floor space needed for a process, allowing for more efficient use of space. This speaks to a problem stated by Applicant of more efficiently using clean room space. Further, '667 shows a pair of enclosed modules aligned directly over/under each other (Figure 1, items A1 and A2; Column 3 Lines 11-19).
- f) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the apparatus of '384 by adding the teaching of '667 to stack the portions of the apparatus because '384 teaches that the portions of the apparatus can be modular and '667 teaches that stacking modular apparatuses improves the optimization of floor space.

- g) As far as the limitation of disposing the drying part above the printing part, this claim would have been obvious because a person of ordinary skill has good reason to pursue the known options with his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In a stacked system consisting of a printing part and a drying part, there are two permutations that these can be stacked in (e.g., drying over printing and printing over drying). One of ordinary skill in the art could have chosen from either of these options with an equally reasonable expectation of success. '384/'667 discloses the claimed invention except for the relative location of the drying and printing parts. It would have been an obvious matter of design choice to locate the drying part directly and vertically above the printing part, since it has been held that rearranging parts of an invention only involves routine skill in the art. *In re Japikse*, 86 USPQ 70.
- h) Both Applicant and '384/'667 disclose stacking the drying part directly and vertically above the printing part. It follows logically that any advantages accrued from this arrangement in one case must inherently apply to this arrangement in the other case; in other words, the accrued advantages claimed by Applicant must apply to the same arrangement of '384/'667.
- i) '687 teaches at Column 4 Lines 14-19 that the method can work with processes having different cycle and load times.
- j) '384 teaches at Column 2 Lines 44-52 that individual substrates receive in succession the printing step and the drying step.

20)With regard to Claim 2, '384/'667 teaches the device of claim 1, further comprising:

- a) At least one inkjet head ('384 Column 12 Lines 36-49) to spray an alignment material onto the substrate and thereby print the alignment layer and being positioned between the printing part and the drying part ('384 Figure 7 shows the inkjet head above the printing part, which is below the drying part by the discussion above).

21)With regard to Claim 3, '384/'667 teaches the device of claim 2, wherein:

- a) At least one array of inkjet heads is positioned in one line according to a long side or a short side of the substrate ('384 Column 19 Lines 42-49) to print the alignment layer onto the long or short side of the substrate at one time.

22)With regard to Claim 4, '384/'667 teaches the device of claim 3, wherein:

- a) A size and an arrangement of the inkjet heads are varied according to a size and a kind of the substrate ('384 Column 8 Line 62 – Column 9 Line 26; if a mono-color filter is desired, all the print heads print one color as discussed in Column 18 Lines 46-49; and the width of printing is determined by the maximum width of the substrate as discussed in Column 19 Lines 42-49).

23)With regards to Claim 5 and 6, '384 teaches a print table to receive the substrate and an inkjet head ('384 Column 12 Lines 36 – 51, talking about moving a print stage and driving an inkjet head assembly); as each of these parts can be moved independently, the apparatus can function by moving the substrate under the stationary inkjet head (Claim 5) or by moving the inkjet over the stationary plate (Claim 6).

- 24)With regard to Claim 7, '384/'667 teach that the coatings are applied by inkjet deposition. Polyimide PI is capable of being deposited by inkjet and therefore the device taught in claim 1 is capable of meeting the limitation of claim 7.
- 25)With regards to Claim 8 and 9, '384/'667 teaches the device of claim 1, wherein:
- a) The drying part includes a dry table ('384 Column 10 Lines 62-65 teaches an oven; Column 9 Lines 47-50 teach that hot plates and hot-air ovens are interchangeable in this process) to dry the alignment layer printed on the substrate by emitting heat.
- 26)With regard to Claim 11, it is well known in the art that alignment layers can be provided in LCD devices. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have used a device capable of printing alignment layers for the purpose of printing alignment layers in LCD devices.
- 27)With regard to Claim 12, '384/'667 teaches that it is known to manufacture electronic components in clean rooms ('667 Column 1 Lines 5 – 30).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Miller/
Examiner, Art Unit 1792

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1792